

1. Description

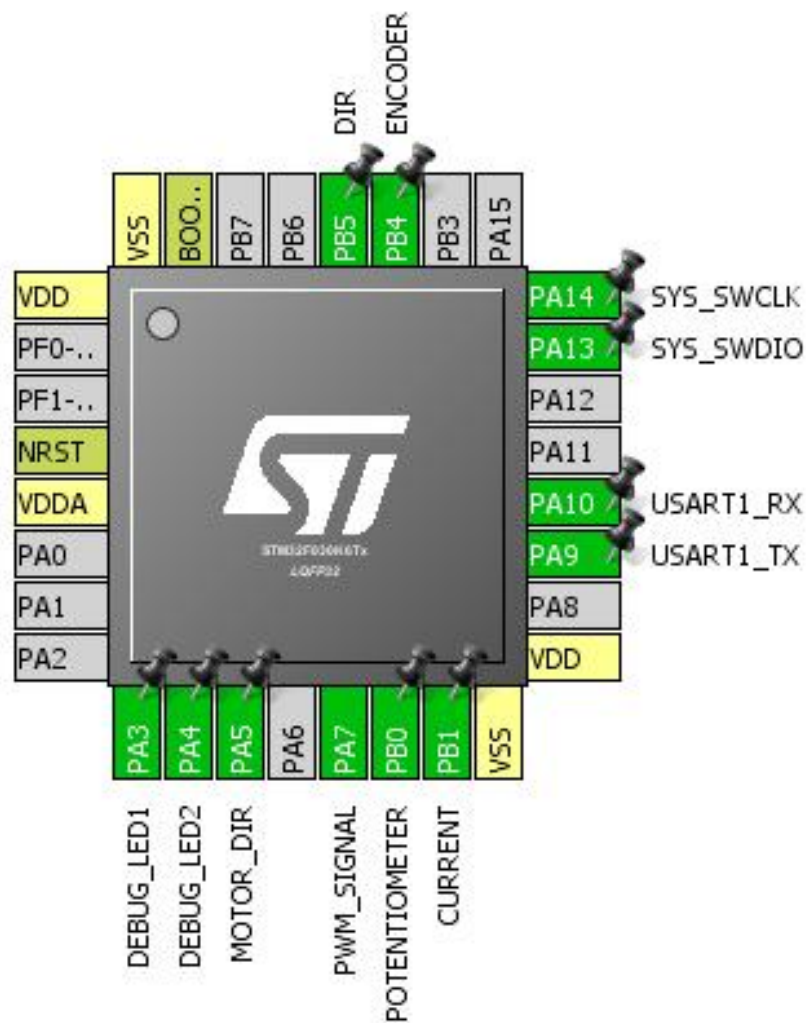
1.1. Project

Project Name	acrobat_v4
Board Name	acrobat_v4
Generated with:	STM32CubeMX 4.25.0
Date	10/18/2018

1.2. MCU

MCU Series	STM32F0
MCU Line	STM32F0x0 Value Line
MCU name	STM32F030K6Tx
MCU Package	LQFP32
MCU Pin number	32

2. Pinout Configuration

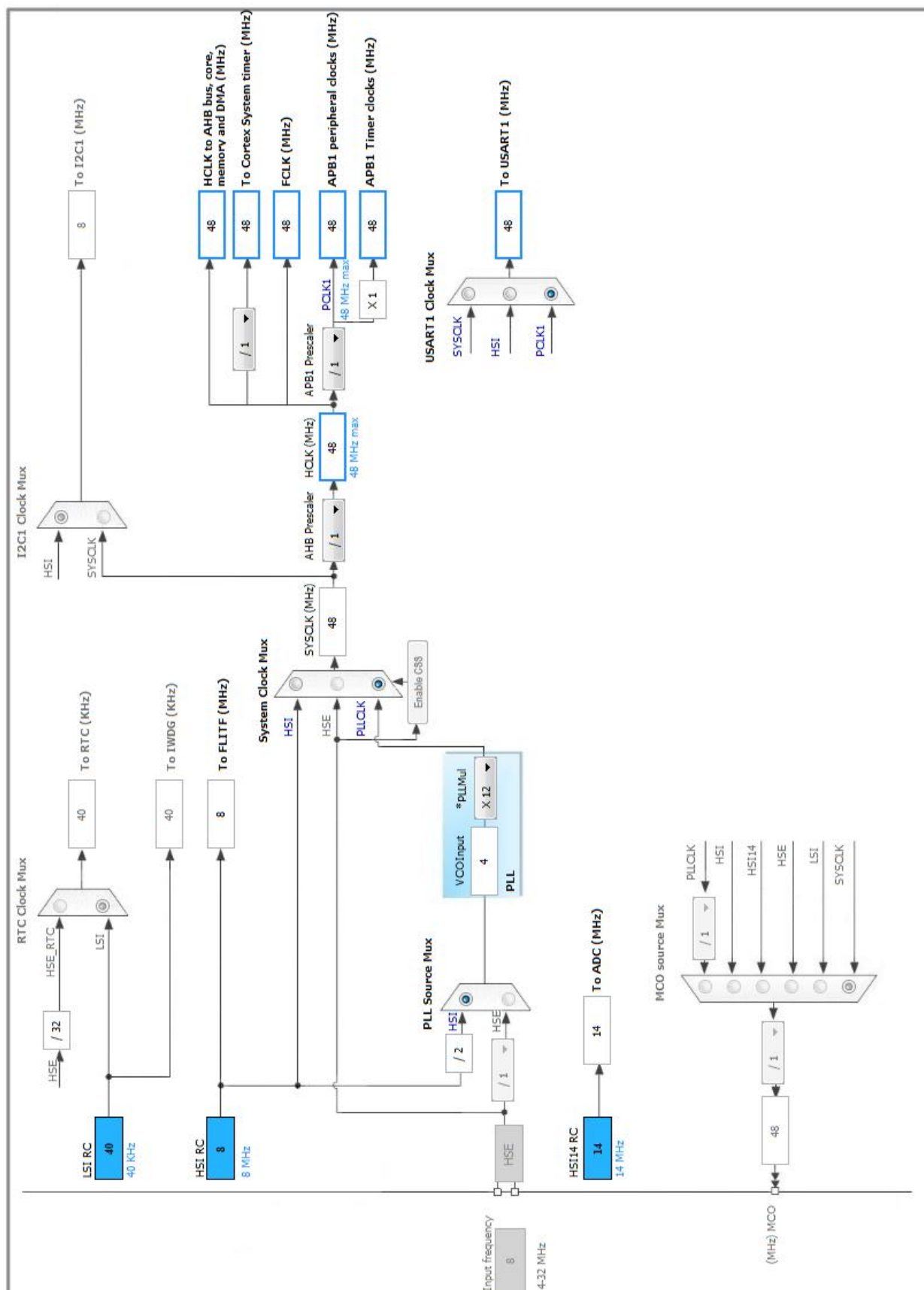


3. Pins Configuration

Pin Number LQFP32	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
1	VDD	Power		
4	NRST	Reset		
5	VDDA	Power		
9	PA3 *	I/O	GPIO_Output	DEBUG_LED1
10	PA4 *	I/O	GPIO_Output	DEBUG_LED2
11	PA5 *	I/O	GPIO_Output	MOTOR_DIR
13	PA7	I/O	TIM3_CH2	PWM_SIGNAL
14	PB0	I/O	ADC_IN8	POTENTIOMETER
15	PB1	I/O	ADC_IN9	CURRENT
16	VSS	Power		
17	VDD	Power		
19	PA9	I/O	USART1_TX	
20	PA10	I/O	USART1_RX	
23	PA13	I/O	SYS_SWDIO	
24	PA14	I/O	SYS_SWCLK	
27	PB4	I/O	GPIO_EXTI4	ENCODER
28	PB5 *	I/O	GPIO_Input	DIR
31	BOOT0	Boot		
32	VSS	Power		

* The pin is affected with an I/O function

4. Clock Tree Configuration



5. IPs and Middleware Configuration

5.1. ADC

mode: IN8

mode: IN9

5.1.1. Parameter Settings:

ADC_Settings:

Clock Prescaler	Asynchronous clock mode
Resolution	ADC 12-bit resolution
Data Alignment	Right alignment
Scan Conversion Mode	Forward
Continuous Conversion Mode	Enabled *
Discontinuous Conversion Mode	Disabled
DMA Continuous Requests	Enabled *
End Of Conversion Selection	End of single conversion
Overrun behaviour	Overrun data preserved
Low Power Auto Wait	Disabled
Low Power Auto Power Off	Disabled

ADC_Regular_ConversionMode:

Sampling Time	239.5 Cycles *
External Trigger Conversion Source	Regular Conversion launched by software
External Trigger Conversion Edge	None

WatchDog:

Enable Analog WatchDog Mode	false
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5.2. SYS

mode: Debug Serial Wire

Timebase Source: SysTick

5.3. TIM3

Channel2: PWM Generation CH2

5.3.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	48 *
Counter Mode	Up
Counter Period (AutoReload Register - 16 bits value)	99 *
Internal Clock Division (CKD)	No Division
auto-reload preload	Disable

Trigger Output (TRGO) Parameters:

Master/Slave Mode (MSM bit)	Disable (Trigger input effect not delayed)
Trigger Event Selection	Reset (UG bit from TIMx_EGR)

PWM Generation Channel 2:

Mode	PWM mode 1
Pulse (16 bits value)	0
Fast Mode	Disable
CH Polarity	High

5.4. TIM14

mode: Activated

5.4.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	192 *
Counter Mode	Up
Counter Period (AutoReload Register - 16 bits value)	2000 *
Internal Clock Division (CKD)	No Division
auto-reload preload	Disable

5.5. TIM16

mode: Activated

5.5.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)

	384 *
Counter Mode	Up
Counter Period (AutoReload Register - 16 bits value)	2000 *
Internal Clock Division (CKD)	No Division
Repetition Counter (RCR - 8 bits value)	0
auto-reload preload	Disable

5.6. USART1

Mode: Asynchronous

5.6.1. Parameter Settings:

Basic Parameters:

Baud Rate	230400 *
Word Length	8 Bits (including Parity)
Parity	None
Stop Bits	1

Advanced Parameters:

Data Direction	Receive and Transmit
Over Sampling	16 Samples
Single Sample	Disable

Advanced Features:

Auto Baudrate	Disable
TX Pin Active Level Inversion	Disable
RX Pin Active Level Inversion	Disable
Data Inversion	Disable
TX and RX Pins Swapping	Disable
Overrun	Enable
DMA on RX Error	Enable
MSB First	Disable

* User modified value

6. System Configuration

6.1. GPIO configuration

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
ADC	PB0	ADC_IN8	Analog mode	No pull-up and no pull-down	n/a	POTENTIOMETER
	PB1	ADC_IN9	Analog mode	No pull-up and no pull-down	n/a	CURRENT
SYS	PA13	SYS_SWDIO	n/a	n/a	n/a	
	PA14	SYS_SWCLK	n/a	n/a	n/a	
TIM3	PA7	TIM3_CH2	Alternate Function Push Pull	No pull-up and no pull-down	Low	PWM_SIGNAL
USART1	PA9	USART1_TX	Alternate Function Push Pull	No pull-up and no pull-down	High *	
	PA10	USART1_RX	Alternate Function Push Pull	No pull-up and no pull-down	High *	
GPIO	PA3	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	DEBUG_LED1
	PA4	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	DEBUG_LED2
	PA5	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	MOTOR_DIR
	PB4	GPIO_EXTI4	External Interrupt Mode with Rising/Falling edge	No pull-up and no pull-down	n/a	ENCODER
	PB5	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	DIR

6.2. DMA configuration

DMA request	Stream	Direction	Priority
USART1_TX	DMA1_Channel2	Memory To Peripheral	High *
ADC	DMA1_Channel1	Peripheral To Memory	High *

USART1_TX: DMA1_Channel2 DMA request Settings:

Mode: Normal
Peripheral Increment: Disable
Memory Increment: **Enable ***
Peripheral Data Width: Byte
Memory Data Width: Byte

ADC: DMA1_Channel1 DMA request Settings:

Mode: **Circular ***
Peripheral Increment: Disable
Memory Increment: **Enable ***
Peripheral Data Width: **Word ***
Memory Data Width: **Word ***

6.3. NVIC configuration

Interrupt Table	Enable	Preenmption Priority	SubPriority
Non maskable interrupt	true	0	0
Hard fault interrupt	true	0	0
System service call via SWI instruction	true	0	0
Pendable request for system service	true	0	0
System tick timer	true	0	0
EXTI line 4 to 15 interrupts	true	0	0
DMA1 channel 1 interrupt	true	1	0
DMA1 channel 2 and 3 interrupts	true	1	0
TIM3 global interrupt	true	1	0
TIM14 global interrupt	true	1	0
TIM16 global interrupt	true	0	0
USART1 global interrupt	true	0	0
Flash global interrupt	unused		
RCC global interrupt	unused		
ADC interrupt	unused		

* User modified value

7. Power Consumption Calculator report

7.1. Microcontroller Selection

Series	STM32F0
Line	STM32F0x0 Value Line
MCU	STM32F030K6Tx
Datasheet	024849_Rev2

7.2. Parameter Selection

Temperature	25
Vdd	3.6

8. Software Project

8.1. Project Settings

Name	Value
Project Name	acrobat_v4
Project Folder	C:\Users\Henry\Desktop\Skripsie\Feedback-Control-of-Robotic-Gymnast-
Toolchain / IDE	TrueSTUDIO
Firmware Package Name and Version	STM32Cube FW_F0 V1.9.0

8.2. Code Generation Settings

Name	Value
STM32Cube Firmware Library Package	Copy only the necessary library files
Generate peripheral initialization as a pair of '.c/.h' files	No
Backup previously generated files when re-generating	No
Delete previously generated files when not re-generated	Yes
Set all free pins as analog (to optimize the power consumption)	No

9. Software Pack Report